

IN THE CLAIMS:

Rewrite the pending claims and add new claims as follows:

1. (Currently Amended) A computer readable memory to direct a computer to function in a specified manner, comprising:

a first set of instructions to automatically determine a type of a speaker of the computer;

a second set of instructions to select a set of filter coefficients for a plurality of digital filter filters based upon the type of the speaker; and

a third set of instructions to realize a parametric equalizer using the plurality of digital filter filters, the digital filter filters producing an output signal to be input to the speaker from the set of filter coefficients and an input signal;

wherein the parametric equalizer comprises a plurality of equalizer bands, each equalizer band having ~~one or more~~ at least two of the plurality of digital filters.

2. (Original) The computer readable memory of claim 1 wherein the second set of instructions further include:

a fourth set of instructions to receive user specified equalizer parameters for the parametric equalizer; and

a fifth set of instructions to calculate the set of filter coefficients from the user specified equalizer parameters.

3. (Previously presented) A computer readable memory to direct a computer to function in a specified manner, comprising:

a first set of instructions to automatically determine a type of a speaker of the computer;

a second set of instructions to select a set of filter coefficients for a digital filter based upon the type of the speaker; and

a third set of instructions to realize a parametric equalizer using the digital filter, the digital filter producing an output signal to be input to the speaker from the set of filter coefficients and an input signal; wherein the parametric equalizer comprises a plurality of equalizer bands, each equalizer band having one or more filters;

wherein the second set of instructions further include:

a fourth set of instructions to receive user specified equalizer parameters for the parametric equalizer;

a fifth set of instructions to calculate the set of filter coefficients from the user specified equalizer parameters; and

a sixth set of instructions for insuring that a value of a cut/boost parameter of the user specified equalizer parameters meets predefined mathematical criteria.

4. (Currently Amended) A computer readable memory to direct a computer to function in a specified manner, comprising:

a first set of instructions to automatically determine a type of a speaker of the computer;

a second set of instructions to select a set of filter coefficients for a digital filter based upon the type of the speaker; and

a third set of instructions to realize a parametric equalizer using the digital filter, the digital filter producing an output signal to be input to the speaker from the set of filter coefficients and an input signal; wherein the parametric equalizer comprises a plurality of equalizer bands, each equalizer band having one or more filters;

wherein the second set of instructions further include:

a fourth set of instructions to receive user specified equalizer parameters for the parametric equalizer;

a fifth set of instructions to calculate the set of filter coefficients from the user specified equalizer parameters;

wherein the third set of instructions comprise:

a ~~seventh~~ sixth set of instructions to realize a first equalizer band of the parametric equalizer, the first equalizer band having a first cut/boost parameter;

~~an eighth~~ a seventh set of instructions to realize a second equalizer band of the parametric equalizer, the second equalizer band having a second cut/boost parameter; and

~~a ninth~~ an eighth set of instructions to realize a third equalizer band of the parametric equalizer, the third equalizer band having a third cut/boost parameter.

5. (Currently Amended) The computer readable memory of claim 4 further comprising:
a ~~tenth~~ ninth set of instructions for insuring a first combined cut/boost of the first, second and third equalizer bands meets predefined mathematical criteria.

6. (Currently Amended) The computer readable memory of claim 5 wherein the ~~tenth~~ ninth set of instructions comprise:

an ~~eleventh~~ a tenth set of instructions to determine whether a second combined cut/boost of the first equalizer band and the second equalizer band meets predefined mathematical criteria;

a ~~twelfth~~ an eleventh set of instructions to determine whether a third combined cut/boost of the second equalizer band and the third equalizer band meets predefined mathematical criteria; and

a ~~thirteenth~~ twelfth set of instructions to determine whether a fourth combined cut/boost of the first equalizer band and the third equalizer band meets predefined mathematical criteria.

7. (Currently Amended) The computer readable memory of claim 6 wherein:

the ~~eleventh~~ tenth set of instructions uses a relationship for adjacent bands to determine whether the second combined cut/boost meets predefined mathematical criteria;

the ~~twelfth~~ eleventh set of instructions uses the relationship for adjacent bands to determine whether the third combined cut/boost meets predefined mathematical criteria; and

the ~~thirteenth~~ twelfth set of instructions uses a relationship for non-adjacent bands to determine whether the fourth combined cut/boost meets predefined mathematical criteria.

8. (Currently Amended) A method for improving audio quality of a computer including a Universal Serial Bus (USB) loud speaker, the method comprising the steps of:

- a) determining automatically a type of the USB loud speaker of the computer;
- b) designating a first set of filter coefficients as a selected set of filter coefficients if the USB loud speaker is of a first type;

c) designating a second set of filter coefficients as the selected set of filter coefficients if the USB loud speaker is of a second type;

d) calculating a third set of filter coefficients from equalizer parameters of a parametric equalizer if user specified equalizer parameters are received;

e) designating the third set of filter coefficients as the selected coefficients if user specified equalizer parameters are received; and

f) realizing a parametric equalizer using a plurality of digital filter filters, the digital ~~filter filters~~ generating an output signal to be input to the USB loud speaker from an input signal and the selected set of coefficients;

wherein the parametric equalizer comprises a plurality of equalizer bands, each such equalizer band having ~~one or more~~ at least two of the plurality of digital filters.

9. (Previously presented) A method for improving audio quality of a computer including a Universal Serial Bus (USB) loud speaker, the method comprising the steps of:

a) determining automatically a type of the USB loud speaker of the computer;

b) designating a first set of filter coefficients as a selected set of filter coefficients if the USB loud speaker is of a first type;

c) designating a second set of filter coefficients as the selected set of filter coefficients if the USB loud speaker is of a second type;

d) calculating a third set of filter coefficients from equalizer parameters of a parametric equalizer if user specified equalizer parameters are received;

e) designating the third set of filter coefficients as the selected coefficients if user specified equalizer parameters are received;

f) realizing a parametric equalizer using a digital filter, the digital filter generating an output signal to be input to the USB loud speaker from an input signal and the selected set of coefficients; wherein the parametric equalizer comprises a plurality of equalizer bands, each such equalizer band having one or more filters; and

g) insuring that a value of a cut/boost parameter of the parametric equalizer meets predefined mathematical criteria.

10. (Previously presented) A method for improving audio quality of a computer including a Universal Serial Bus (USB) loud speaker, the method comprising the steps of:

a) determining automatically a type of the USB loud speaker of the computer;

b) designating a first set of filter coefficients as a selected set of filter coefficients if the USB loud speaker is of a first type;

c) designating a second set of filter coefficients as the selected set of filter coefficients if the USB loud speaker is of a second type;

d) calculating a third set of filter coefficients from equalizer parameters of a parametric equalizer if user specified equalizer parameters are received;

e) designating the third set of filter coefficients as the selected coefficients if user specified equalizer parameters are received;

f) realizing a parametric equalizer using a digital filter, the digital filter generating an output signal to be input to the USB loud speaker from an input signal and the selected set of coefficients; wherein the parametric equalizer comprises a plurality of equalizer bands, each such equalizer band having one or more filters; and wherein the parametric equalizer includes a first equalizer band, a second equalizer band and a third equalizer band.

11. (Previously presented) The method of claim 10 wherein step g comprises the substeps of:

g1) determining whether a first combined cut/boost of the first equalizer band and the second equalizer band meets predefined mathematical criteria;

g2) determining whether a second combined cut/boost of the second equalizer band and the third equalizer band meets predefined mathematical criteria; and

g3) determining whether a third combined cut/boost of the first equalizer band and the third equalizer band meets predefined mathematical criteria.

12. (Previously presented) The method of claim 11 wherein steps g1 and g2 use a relationship for adjacent bands and step g3 uses a relationship for non-adjacent bands.

13. (Previously presented) A computer program product for use in conjunction with a computer system, the computer program product comprising a computer readable storage medium and a computer program mechanism embedded therein, the computer program

mechanism comprising one or more modules to improve audio quality of the computer system, the one or more modules including:

- a first set of instructions to automatically determine a type of a Universal Serial Bus (USB) speaker of the computer system;

- a second set of instructions to select a set of filter coefficients for a digital filter based upon the type of the USB speaker; and

- a third set of instructions to realize a parametric equalizer using a the digital filter, the digital filter producing an output signal to be input to the USB speaker from the set of filter coefficients and an input signal;

wherein the parametric equalizer comprises a plurality of equalizer bands, each such equalizer band having one or more filters.

14. (Previously presented) The computer program product of claim 13 wherein the second set of instructions further include:

- a fourth set of instructions to receive equalizer parameters; and

- a fifth set of instructions to calculate the set of filter coefficients from the equalizer parameters if received without regard to the type of the speaker.

15. (Currently Amended) A computer program product for use in conjunction with a computer system, the computer program product comprising a computer readable storage medium and a computer program mechanism embedded therein, the computer program mechanism comprising one or more modules to improve audio quality of the computer system, the one or more modules including:

- a first set of instructions to automatically determine a type of a Universal Serial Bus (USB) speaker of the computer system;

- a second set of instructions to select a set of filter coefficients for a digital filter based upon the type of the USB speaker; and

- a third set of instructions to realize a parametric equalizer using a the digital filter, the digital filter producing an output signal to be input to the USB speaker from the set of filter coefficients and an input signal; wherein the parametric equalizer comprises a plurality of equalizer bands, each such equalizer band having one or more filters;

wherein the second set of instructions further include:

a fourth set of instructions to receive equalizer parameters; and
a fifth set of instructions to calculate the set of filter coefficients from the equalizer parameters if received without regard to the type of the speaker; and
wherein the third set of instructions comprise:

a ~~seventh~~ sixth set of instructions to realize a first equalizer band of the parametric equalizer, the first equalizer band having a first cut/boost parameter;

~~an eighth~~ a seventh set of instructions to realize a second equalizer band of the parametric equalizer, the second equalizer band having a second cut/boost parameter; and

~~a ninth~~ an eighth set of instructions to realize a third equalizer band of the parametric equalizer, the third equalizer band having a third cut/boost parameter.

16. (Currently Amended) The computer program product of claim 15 ~~wherein a tenth~~ further comprising a ninth set of instructions for insuring a first combined cut/boost of the first, second and third equalizer bands meets predefined mathematical criteria.

17. (Currently Amended) The computer program product of claim 16 wherein the ~~tenth~~ ninth set of instructions comprise:

~~an eleventh~~ a tenth set of instructions to determine whether a second combined cut/boost of the first equalizer band and the second equalizer band meets predefined mathematical criteria;

a ~~twelfth~~ an eleventh set of instructions to determine whether a third combined cut/boost of the second equalizer band and the third equalizer band meets predefined mathematical criteria; and

a ~~thirteenth~~ twelfth set of instructions to determine whether a fourth combined cut/boost of the first equalizer band and the third equalizer band meets predefined mathematical criteria.

18. (Currently Amended) The computer program product of claim 17 wherein:
the ~~eleventh~~ tenth set of instructions uses a relationship for adjacent bands to determine whether the second combined cut/boost meets predefined mathematical criteria;

the ~~twelfth~~ eleventh set of instructions uses the relationship for adjacent bands to determine whether the third combined cut/boost meets predefined mathematical criteria; and

the ~~thirteenth~~ twelfth set of instructions uses a relationship for non-adjacent bands to determine whether the fourth combined cut/boost meets predefined mathematical criteria.

19. (Previously presented) A computer readable memory to direct a computer to function in a specified manner, comprising:

a first set of instructions to automatically determine a type of a speaker of the computer;

a second set of instructions to select a set of filter coefficients for a digital filter based upon the type of the speaker;

a third set of instructions to realize a parametric equalizer using the digital filter, the digital filter producing an output signal to be input to the speaker from the set of filter coefficients and an input signal;

a fourth set of instructions to realize a first equalizer band of the parametric equalizer, the first equalizer band having a first cut/boost parameter;

a fifth set of instructions to realize a second equalizer band of the parametric equalizer, the second equalizer band having a second cut/boost parameter; and

a sixth set of instructions to realize a third equalizer band of the parametric equalizer, the third equalizer band having a third cut/boost parameter.

20. (Previously presented) A computer program product for use in conjunction with a computer system, the computer program product comprising a computer readable storage medium and a computer program mechanism embedded therein, the computer program mechanism comprising one or more modules to improve audio quality of the computer system, the one or more modules including:

a first set of instructions to determine a type of a Universal Serial Bus (USB) speaker of the computer system;

a second set of instructions to select a set of filter coefficients for a digital filter based upon the type of the USB speaker;

a third set of instructions to realize a parametric equalizer using the digital filter, the digital filter producing an output signal to be input to the USB speaker from the set of filter coefficients and an input signal;

a fourth set of instructions to realize a first equalizer band of the parametric equalizer, the first equalizer band having a first cut/boost parameter;

a fifth set of instructions to realize a second equalizer band of the parametric equalizer, the second equalizer band having a second cut/boost parameter; and

a sixth set of instructions to realize a third equalizer band of the parametric equalizer, the third equalizer band having a third cut/boost parameter.